



Enoyl-ACP reductases

Description of Technology: This invention is in the field of plant molecular biology. More specifically, this invention pertains to nucleic acid fragments encoding corn (*Zea mays*), rice (*Oryza sativa*), and soybean (*Glycine max*) enoyl-ACP reductases in plants and seeds.

Patent Listing:

1. **US Patent No. 7,141,721**, Issued November 28, 2006 “Enoyl-ACP reductases”

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Market Potential: Fatty acid biosynthesis in plants takes place in plastids, and closely resembles that in bacteria. The process mainly involves cyclic reactions that incorporate two-carbon units into a growing acyl chain.

Fatty acid synthesis is an important metabolic pathway, since fatty acids are essential components of plant membranes and seed oils, among others. The fatty acid composition of plant membranes is thought to be an important factor in responding to environmental stress. Accordingly the availability of nucleotide sequences encoding enoyl-ACP reductase provides a means to manipulate fatty acid composition, and consequently, to improve plant response to stress and seed oil composition, both of which are important agronomic characteristics.

Since fatty acids are essential to plant growth and development, inhibiting enoyl-ACP reductase can lead to inhibition of plant growth and development. Indeed, *Arabidopsis* plants with a defective enoyl-ACP reductase gene exhibit premature cell death and dramatic alterations in plant morphology which include chlorotic and curly leaves, distorted siliques, premature senescence of primary inflorescences, reduced fertility, and semidwarfism (Mou et al. (2000) *Plant Cell* 12:405-417). Also, the antibacterial compound triclosan and the antitubercular drug isoniazid have enoyl-ACP reductase as their molecular target (Blanchard (1996) *Annu. Rev. Biochem.* 65:215-239; Suguna et al. (2001) *Biochem. Biophys. Res. Commun.* 283:224-228). Accordingly, the nucleotide sequences disclosed herein provide a starting point for herbicide and fungicide discovery and design.

Benefits:

- Allows for discovery of herbicides and fungicides

Applications:

- Agrochemicals

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